REMARKS

The Office Action mailed December 22, 2006, has been carefully reviewed and by this Amendment, claims 1-16 have been amended and new claims 17-20 have been added. Claims 1-20 are pending in the application. Claims 1 and 17 are independent.

The Examiner acknowledged Applicants' claim for foreign priority based on Swedish applications SE 0202432-19 filed August 15, 2002, but indicated that no certified copy of this document had been received. Applicants note that the present application is a nationalization of international application PCT/SE03/01282 and that, in accordance with PCT Rule 17.1, priority documents were properly submitted to the International Bureau in PCT/DK01/00265 as evidenced by the enclosed copy of Form PCT/IB/304. Under PCT Rule 17.2, Applicants are not required to furnish further copies of the priority documents to the U.S. Patent and Trademark Office as such are available through the International Bureau. Therefore, Applicants' claim for priority has been properly perfected and Applicants request acknowledgement that all formal matters have been complied with so that the cover page of the issued patent will indicate the foreign priority thereon.

The Examiner rejected claims 5 and 10 under 35 U.S.C. 112, second paragraph, as being indefinite. By this Amendment, the indicated phrases have been deleted. Withdrawal of the rejection is requested.

The Examiner rejected claims 1-10, 12 and 13 under 35 U.S.C. 102(e) as being unpatentable over U.S. Patent No. 6,589,657 to Dannenberg. Under 35 U.S.C. 103(a), the Examiner rejected claim 11 as being unpatentable over Dannenberg in view of U.S. Patent No. 6,602,587 to Macquart et al. ("Macquart"), rejected claims 14 and 15 as being unpatentable over Dannenberg as modified by Macquart and further in view of U.S. Patent No. 3,799,650 to Saxe, and rejected claim 16 as being unpatentable over Dannenberg as modified by Saxe and further in view of U.S. Patent No. 4,296,995 to Bickel.

As an initial matter, Applicants note that none of the patents relied upon by the Examiner in rejecting the pending claims are listed on the Examiner's Form PTO-892. Nor were these references cited during the international phase so as to be included on the record. Accordingly, Applicants request that the Examiner provide a further Form PTO-892 with the next Action listing and initialing the cited art so that such art will be of

record and will be included on the cover page of any patent issuing on this application.

Turning to the substantive rejections, as clarified in amended claim 1 and set forth in new claim 17, the present invention is directed to a pane that is provided with at least two distinct and different layers. The first of these layers acts to reduce the reflection from a first electromagnetic radiation such as, for example, radar. At the same time, the second layer (or second and third layers as applicable) serves to *increase* the emittance of the pane to such a degree that the heat radiated from the pane essentially corresponds to the heat radiated from the surrounding parts of the pane, that is, from the vessel's hull or from the vehicle. Finally, the second layer (or second and third layers as applicable) does not interfere with the transmittance of visible light as a user of a vessel or vehicle provided with a pane according to the present invention must be able to see through the pane.

The means by which the first objective is attained, namely to reduce the reflection from radar, is well known in the art. However, to obtain the second objective, i.e. to increase the emittance of the pane, the second layer (or second and third layers as applicable), is a radiation absorbing layer. An

absorbing layer can here preferably be characterized as one in which the complete refractive index of the material (the complete refractive index N is the parameter that determines all the optical properties of a material) contains an extinction coefficient (or equivalently an absorption coefficient, since these entities are related) different from zero.

Generally the refractive index N of a material is a complex value given by N = n+ik, where n is the common refractive index, while k is the extinction coefficient. The entity i is defined to be the square root of -1. Hence, for an absorbing material, the total refractive index has to be a complex value. As a result, a material having an extinction coefficient of zero cannot be an absorbing layer because when k = 0, N = n. In the claimed invention, however, the second layer (or second and third layers as applicable), is an absorbing material.

Therefore, the part of the present invention that aims to increase the emittance of the pane is based on providing the pane with at least one layer that absorbs IR-radiation in the range of 2-20 micrometer. Instead of just one layer, in another embodiment there are two layers of absorbing materials in which one layer is made of a material that absorbs IR-radiation in the range 3-5 micrometer while the other layer comprises a material

that absorbs IR-radiation in the range 7-14 micrometer. Absorbing radiation in these IR-ranges leads to an increase of the emittance of the pane, as is stated in the application (see, for example, page 5, lines 7-8).

Dannenberg discloses an optical coating with multilayer design and also a method of producing such a coating. In the Dannenberg design, a first layer is chosen to have a specific optical thickness corresponding to a reference wavelength in a spectral region bounded by the visible spectrum. The second layer is also defined to have a specific optical thickness given in terms of the reference wavelength and furthermore has a specific refractive index. Finally the third layer in the multilayer design is given a specific refractive index. The purpose of this multilayer design is to obtain an anti-reflective optical coating. Obtaining an anti-reflective optical coating is not what the present invention aims to achieve.

On the contrary, the present invention is directed to creating a multi-layer design that reflects certain radiation while it *absorbs* radiation of a second kind. Specifically, the claimed structure of the present invention reflects radar while at the same time absorbing IR-radiation. Furthermore, the degree of absorption of the IR-radiation is chosen in such a way that

the pane offers the same emittance as the surrounding hull portion of the vehicle. Finally, according to the claimed multi-layer design, the pane and its layers are transparent to visible light.

If one were to use the multilayer design according to Dannenberg to obtain the claimed invention, i.e., to increase the emittance of the pane in the IR-range, then one would have to choose as the second layer a material that absorbs IR-radiation in that range. If one would actually choose such a material, than the other parameters disclosed by Dannenberg, that is, the values of the refractive index and the optical thickness would be unnecessary since the objective of the present application does not hinge on these parameters. Therefore, to say that Dannenberg teaches the present invention requires that the actual purpose and function to which Dannenberg is directed be eliminated. Hence, Dannenberg teaches against the claimed invention.

The present invention is dependent on the fact that the absorbing material has a non-zero extinction coefficient. The physical thickness of the layers according to the claimed invention is a parameter that is used to alter the degree of absorption. For example, if one needed to increase the emittance to 0.7, one would have to specify a specific thickness which is

dependent on the material used for the layer. The same argument can be used for other multilayer designs that are defined by a parameter other than the extinction coefficient. If such a multilayer design were to be used to obtain the objectives of the claimed invention, the designer would have to choose some material that is absorbing in the IR-radiation range and then adjust the thickness of the layer to obtain the sought after absorption level. There would then be no need to specify any other parameters for the layer.

Hence the problem to be solved according to the present application is to obtain a multi-layered design in which at least one layer absorbs radiation within a specified IR-range and consequently the pane's emittance for that IR-range is increased. There if nothing in Dannenberg, however, that teaches or suggests the use of an absorbing material for the layers. Instead, Dannenberg is silent with respect to such a design and further does not even suggest such a design. Dannenberg therefore cannot and does not disclose a multi-layered design having the elements of the present invention as set forth in claims 1 and 17.

For at least the foregoing reasons, claims 1 and 17 are patentable over the prior art. Claims 2-16 and 18-20 are also in

condition for allowance as claims properly dependent on an allowable base claim.

Furthermore, with respect to the dependent claims, Dannenberg does not support the Examiner's conclusion that some of the given oxides are conductive solely based on the fact that they are metallic oxides. In general, this is not true since most oxides are dielectric at room temperature and hence not conductive. Applicants acknowledge that there are though some oxides that are conductive; VO2, for example, goes through a phase change at about 68 degrees Celsius and becomes conductive. It might well be that other oxides also exist that are conductive at room temperature, but nonetheless it is not obvious that oxides are conductive at room temperature.

With respect to claim 4, the Examiner states that "titanium is characterized as nearly stochiometric". Applicants do not agree, as at least two distinct elements or substances are needed to define a compound as stochiometric.

In regard to claims 7 and 8, Applicants suggest that the Examiner may have miscalculated the thickness of the layers. If referring to 0.1 λ_0 - 0.25 λ_0, and if λ_0 is in the range 380 nm to 780 nm, the Examiner should arrive at 0.078-0.195 micrometer for the upper bound and 0.038 - 0.095 micrometer for the lower

value of λ_0, not 0.3 to 0.8 micrometer. If, on the other hand, the Examiner refers to the combined layers, the result reached should have an upper bound of 0.56 λ_0 (0.56 corresponds to the largest combined thickness of the two layers, here 0.31+0.25), which equals 0.436 micrometer for λ_0 = 780 nm, while the lower bound is given by $(0.27+0.1)\lambda_0$ = 0.140 micrometer for λ_0 =380 nm. The same can be said about the thickness given on page 9 of the Office Action.

The Examiner also states that the different refractive index and the emission in the IR range are an indication of a material with residual beam properties. Applicants respectfully note that, in general, this is not true.

Moreover, in connection with claim 12, the Examiner states that the thickness of the third layer is approximately in the range 0.5 - 1.5 micrometer if the IR-range is 1-14 micrometer. With the present invention, however, the thickness of the layers is varied to obtain the wanted absorption degree, and this thickness is dependent on which material is used for the layer.

With this amendment and the foregoing remarks, it is respectfully submitted that the present application is in condition for allowance. Should the Examiner have any questions

or comments, the Examiner is cordially invited to telephone the undersigned attorney so that the present application can receive an early Notice of Allowance.

Respectfully submitted,

JACOBSON HOLMAN PLLC

By Eric Jacobson Reg No 40,495
for Harvey B. Jacobson, Jr.
Reg. No. 20,851

400 Seventh Street, N.W.
Washington, D.C. 20004-2201
Telephone: (202) 638-6666
Date: May 22, 2007
HBJ:SCB
R:\SBAILEY\2007\05-07\P70412US0 - Amd 05-07.wpd

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING SUBMISSION OR TRANSMITTAL OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

To:

FÖRSVARETS MATERIELVERK
Patentenheten
S-115 88 Stockholm
Sweden

FÖRSVARETS MATERIELVERK
Patentenheten
2003 -09- 26

Date of mailing (day/month/year) 09 September 2003 (09.09.03)	
Applicant's or agent's file reference P 03-128:3	**IMPORTANT NOTIFICATION**
International application No. PCT/SE03/01282	International filing date (day/month/year) 15 August 2003 (15.08.03)
International publication date (day/month/year) Not yet published	Priority date (day/month/year) 15 August 2002 (15.08.02)
Applicant TOTALFÖRSVARETS FORSKNINGSINSTITUT et al	

1. The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).

2. This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.

3. An asterisk(*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

4. The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

Priority date	Priority application No.	Country or regional Office or PCT receiving Office	Date of receipt of priority document
15 Augu 2002 (15.08.02)	0202432-1	SE	27 Augu 2003 (27.08.03)

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Laurence NICOLO
Facsimile No. (41-22) 338-70-90	Telephone No. (41-22) 338 9949

Form PCT/IB/304 (July 1998)

005845306